SHARP OPTONICA

SERVICE MANUAL

RP-2727H

MODEL RP-2727H

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

SPECIFICATIONS

GENERAL

Power source:	AC 110/220/240V, 50/60Hz
Power consumption:	5W
Semiconductors:	1-IC 25-transistor 7-diode 2-hall elements
Dimensions: (with dust cover)	Width: 445mm Height: 147mm Depth: 355mm
Weight:	15kg

TURNTABLE

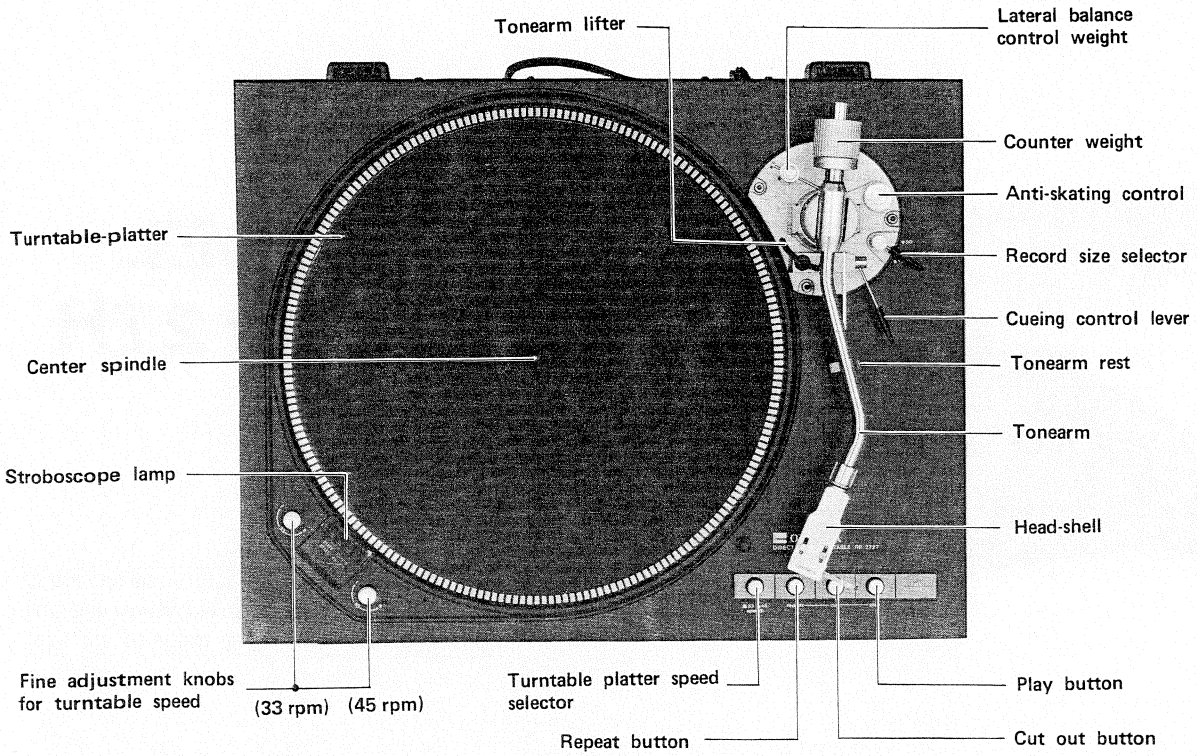
Motor:	DC servo motor with 72-pole frequency generator
Drive system:	Direct-drive system
Speed:	33-1/3 and 45rpm
Speed control range:	Within ± 4% (Individual control for 33-1/3 & 45rpm)
Wow & Flutter:	±0.045% (DIN 45 507) 0.03% (JIS C-5521)
Rumble:	Better than 68dB (DIN-B)
Turntable platter:	31cm (12in.) aluminum diecast with stroboscope marks

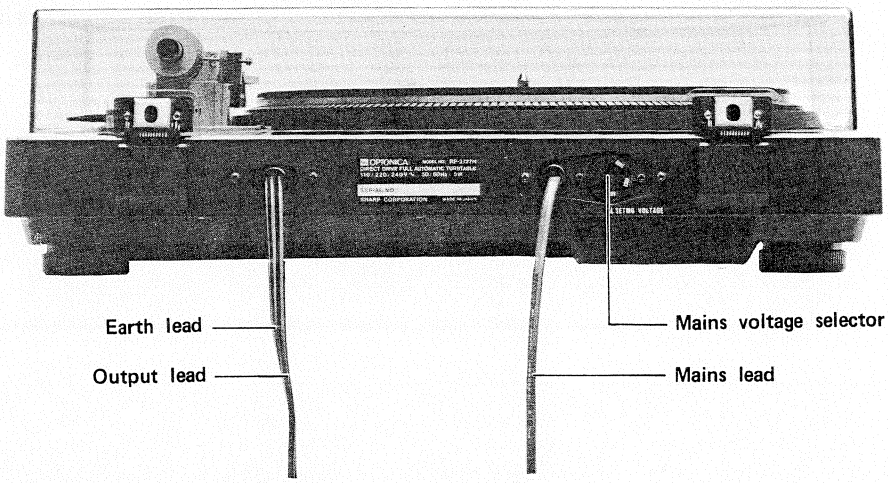
TONEARM

Type:	Static-balance S-shaped pipe arm
Effective length:	210mm
Overhang:	14mm
Off-set angle:	19°
Cartridge weight range:	4 ~ 12grams

SHARP CORPORATION OSAKA, JAPAN

DESIGNATION OF PARTS





DISASSEMBLY

* Disconnect all leads connected to the back of the unit.
1. Remove twelve (12) screws retaining the bottom cover. (Refer to Figure 2)
2. Mechanical parts removal. (Refer to Figure 20)

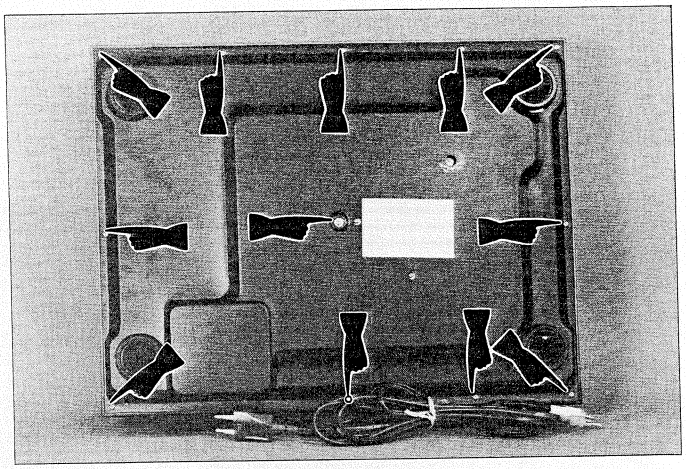


Figure 2

OPERATION ON MAINS

VOLTAGE SELECTION

Check the preset voltage before connecting the mains plug to a mains outlet. If the setting is different from your local supply mains voltage, the selector must be re-set as follows. Rotate the selector with a screw driver, aligning the arrow mark to your local voltage number.

Note:

Since this set uses DC motor, the operation is regardless of whether a household power supply is of 50Hz or 60Hz.

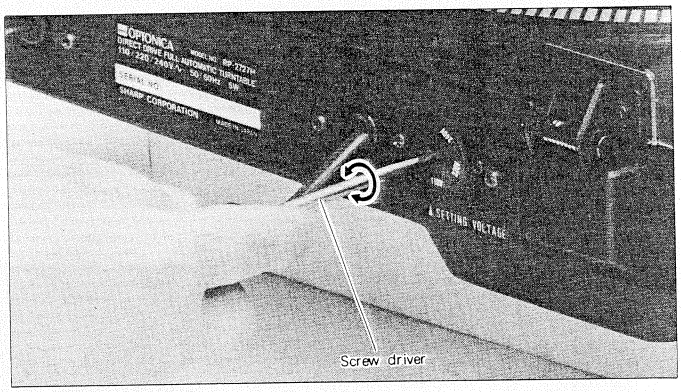


Figure 3

MOUNTING OF PHONO-CARTRIDGE ON HEAD-SHELL

1. No cartridge is furnished with this unit. Please purchase the cartridge from an Audio Shop.
2. Referring to Figure 4 Ⓐ , connect the cartridge to the head-shell by use of leads.
3. Provide a distance of 50mm between the stylus end and the rubber packing on the head-shell. (Refer to Figure 4 Ⓑ)

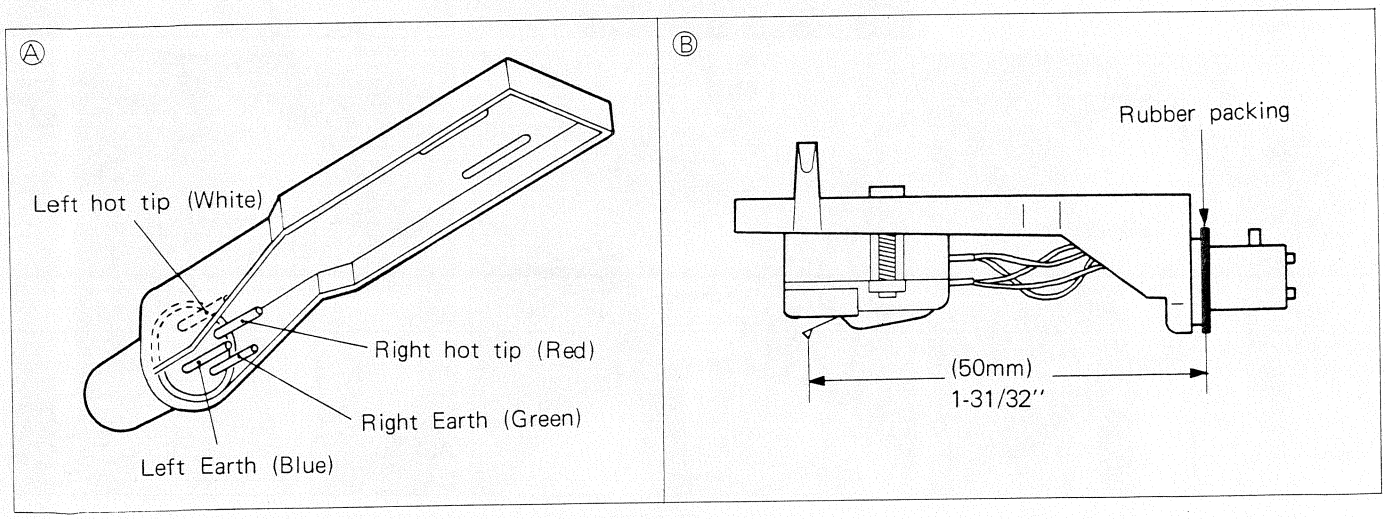


Figure 4

ASSEMBLING

This unit is protected when delivered against vibration or impact during transportation: preparation in accordance with the following procedures.

1. Mount the counter-weight on the rear part of tonearm. (Refer to Figure 5 Ⓐ)
2. Insert the head-shell into the top of tonearm and turn the clamp collar in arrow direction to fix the head-shell. (Refer to Figure 5 Ⓑ)
3. Gently set the platter over the center spindle. (Refer to Figure 5 Ⓒ)
4. Place the rubber sheet on the platter.

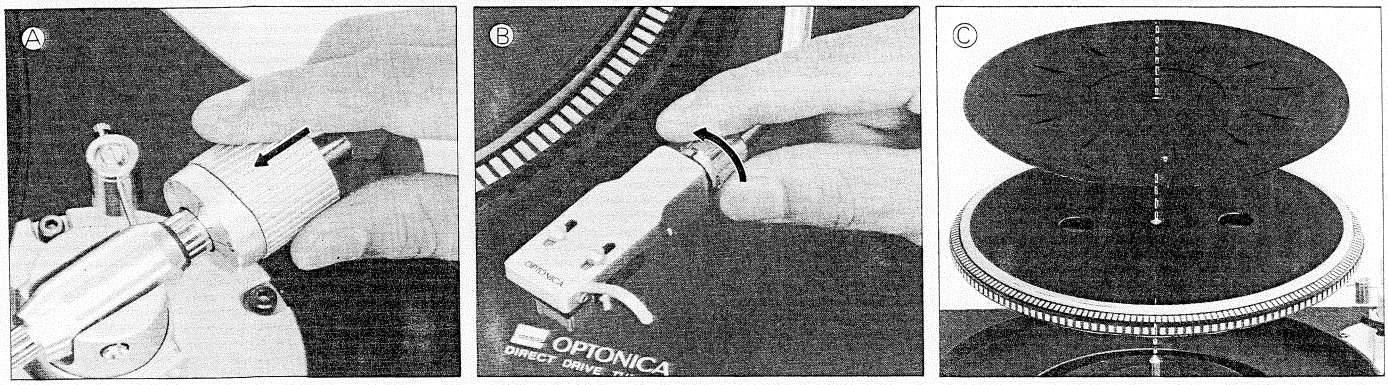


Figure 5

STYLUS PRESSURE ADJUSTMENT

1. Inset the mains plug into a wall outlet.
2. Pull down the lever of tonearm lifter toward you, and detach the tonearm from the tonearm rest. (Refer to Figure 6 Ⓐ)
3. While rotating the counter weight, move it forward and backward until the tonearm is balanced horizontally. (Refer to Figure 6 Ⓑ)
4. Keeping the tonearm horizontal, adjust the lateral balance. (See page 5. ADJUSTMENT OF LATERAL BALANCE)
5. Supporting the counter-weight by your hand, turn scale ring so that '0' graduation aligns with the line mark on the tonearm. (Fig 6 Ⓒ)
6. Turn the counter-weight in the direction of arrow shown in Figure 6 Ⓓ , and align the value of proper stylus pressure for the phono-cartridge mounted on the head-shell with line mark.

Figures of the stylus pressure are expressed in the unit of gram.

7. Rotate the anti-skating control to set it to the same value as that once set for the stylus pressure in the above step 6. (Refer to Figure 6 Ⓔ)

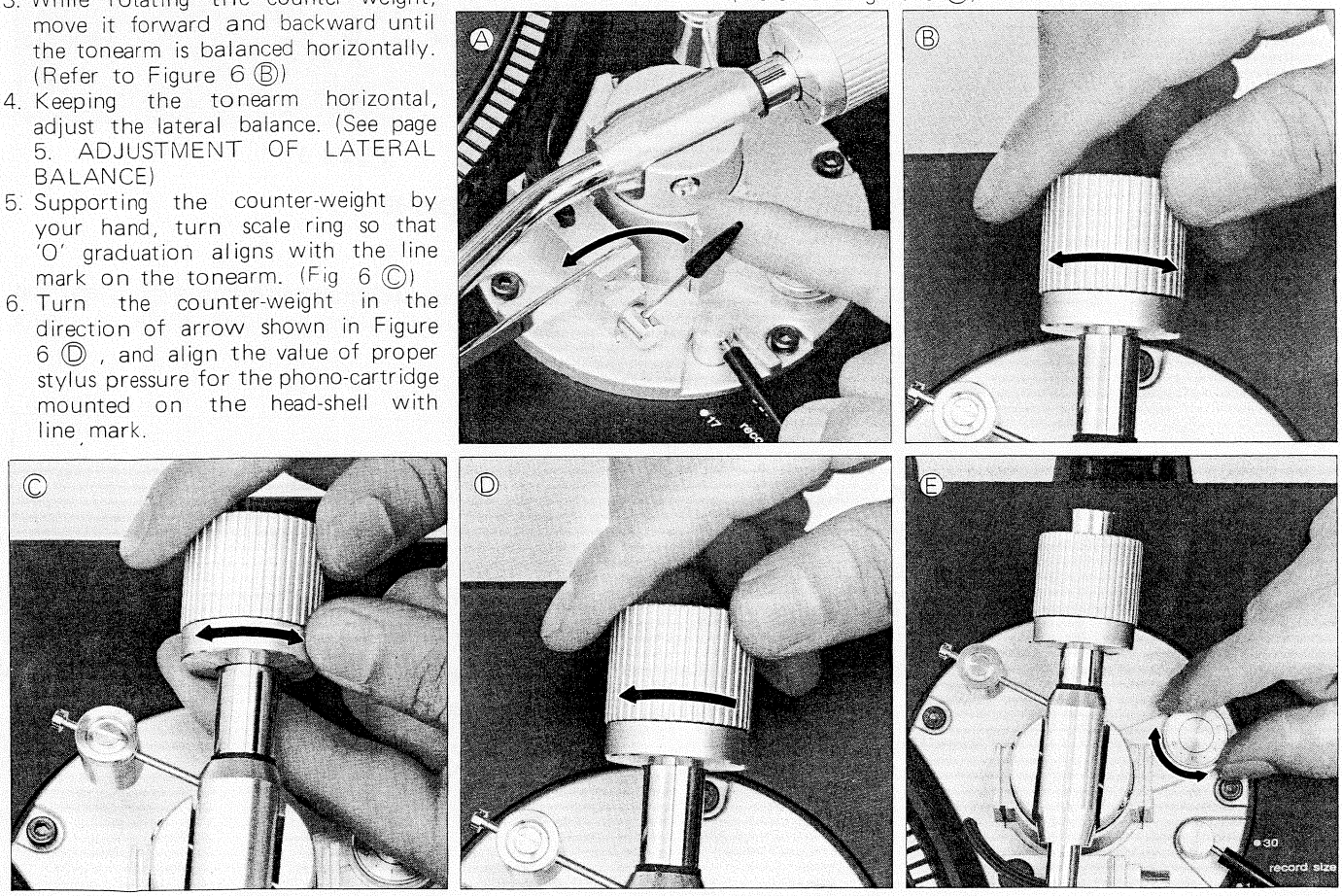


Figure 6

ADJUSTMENT OF LATERAL BALANCE

Prior to this adjustment, be sure to set the cartridge to the turntable and adjust the stylus pressure to '0' gram (with the tonearm being balanced horizontally.)

1. Loosen screw of the lateral balance control weight (lateral balancer) located at the tonearm. (Refer to Figure 7 Ⓐ)
2. Make the turntable be inclined by holding its one end up by about 1cm. (Refer to Figure 7Ⓑ)
3. As a result, if the tonearm tends to move to right or left, this means that the lateral balance is deviated. In this case, slide the weight to the position where the tonearm won't be able to move. (Refer to Figure 7Ⓓ)
4. After the adjustment, retighten the said screw. (Refer to Figure 7 Ⓓ)

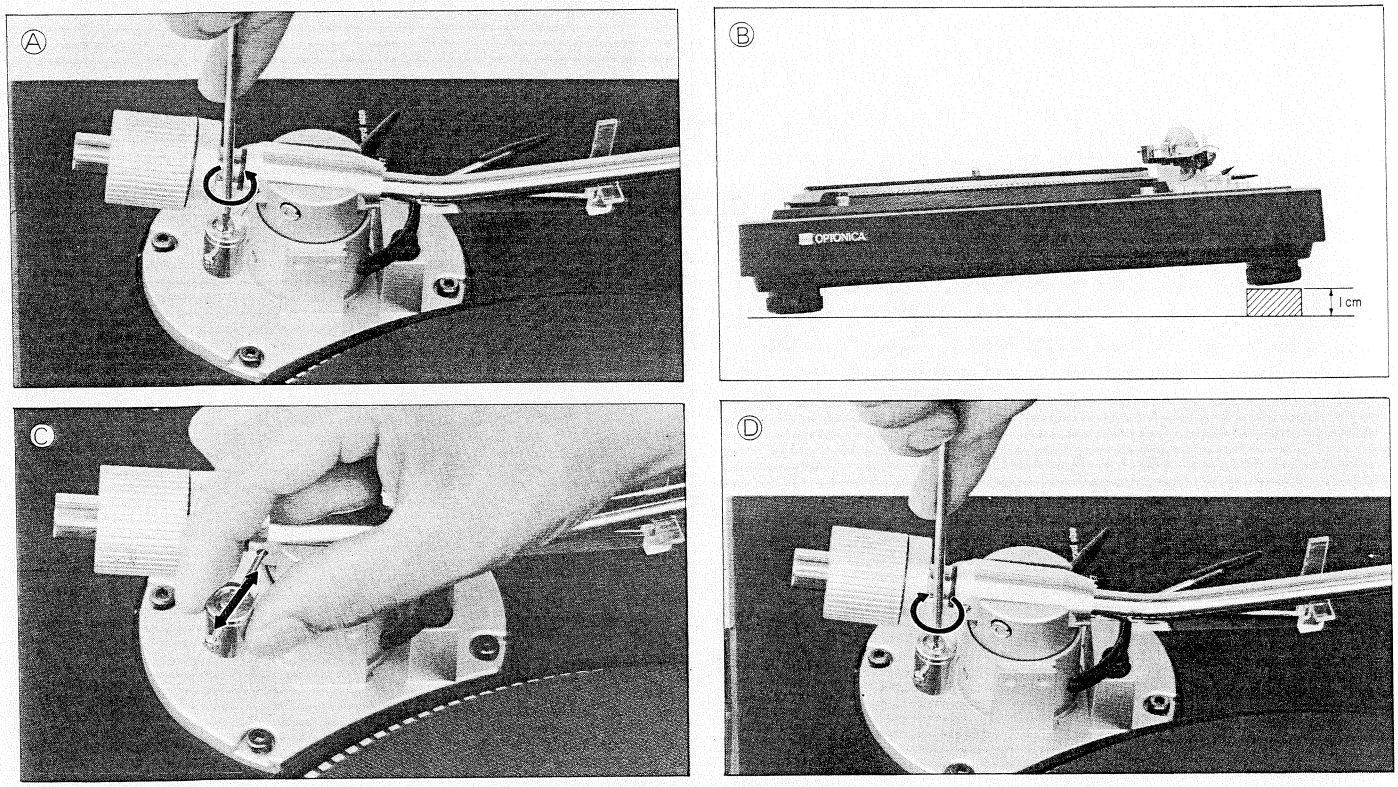


Figure 7

ADJUSTMENT OF AUTO LEAD-IN MECHANISM

Before the set leaves the factory, descending position of the stylus has been adjusted properly but it may be, however, that under automatic play mode the stylus top end cannot descend on the starting groove correctly because of the adjustment having been deviated due to vibration during the transportation or if a disc record outside the specification is used.
If the descending position of the stylus is not correct, adjust the screw provided at the bottom of this unit.
When the stylus descends outside the record periphery, rotate the screw toward 'IN'.
While, when it descends inside the starting groove of the record, rotate the screw toward 'OUT'.
Motion of one graduation of the screw can change the descending position by 1.5mm.

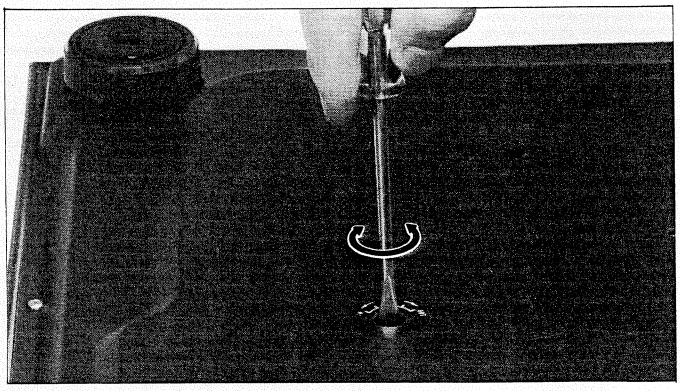


Figure 8

TONEARM LIFTER

·When the player is operated after it has been unused for a long time, the tonearm may not descend in initial action because of the property of the oil used.
In this case, move the tonearm lifter 2 to 3 times up and down with fingers.
Then, the lifter is able to function normally.

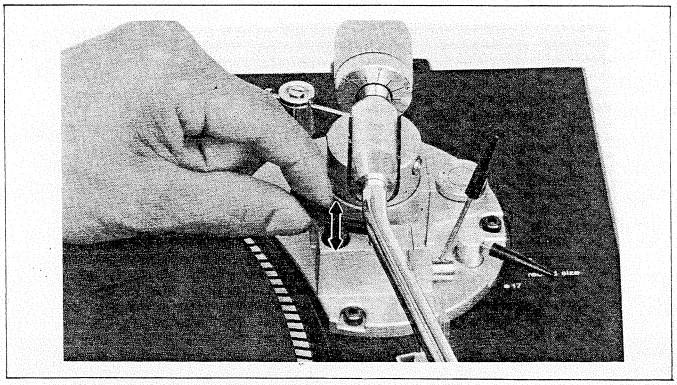


Figure 9

CLEANING

1. Clean the cabinet with a soft cloth moistened with a detergent. Do no use strong solvents such as benzine and thinner which may cause loss of luster or finish.
2. When cleaning the stylus tip, use a soft brush (not furnished) to wipe it off in the arrowed direction shown in figure.
   Never touch the stylus tip with fingers.
   The stylus tip may break, otherwise.

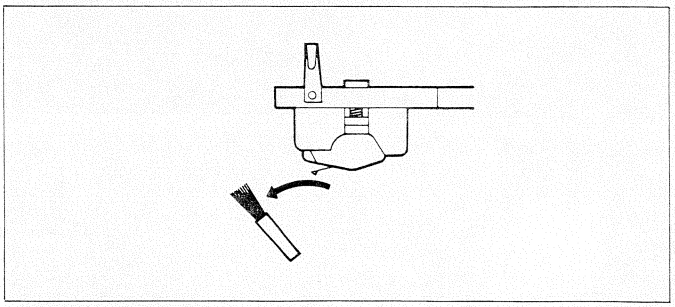


Figure 10

BEHAVIORS OF CONTROL CIRCUIT

This control circuit is a frequency generator servo type that detects output of the dynamo synchronizing with the motor so that this detected output is considered frequency, thereby controlling the speed of a disk to be used.

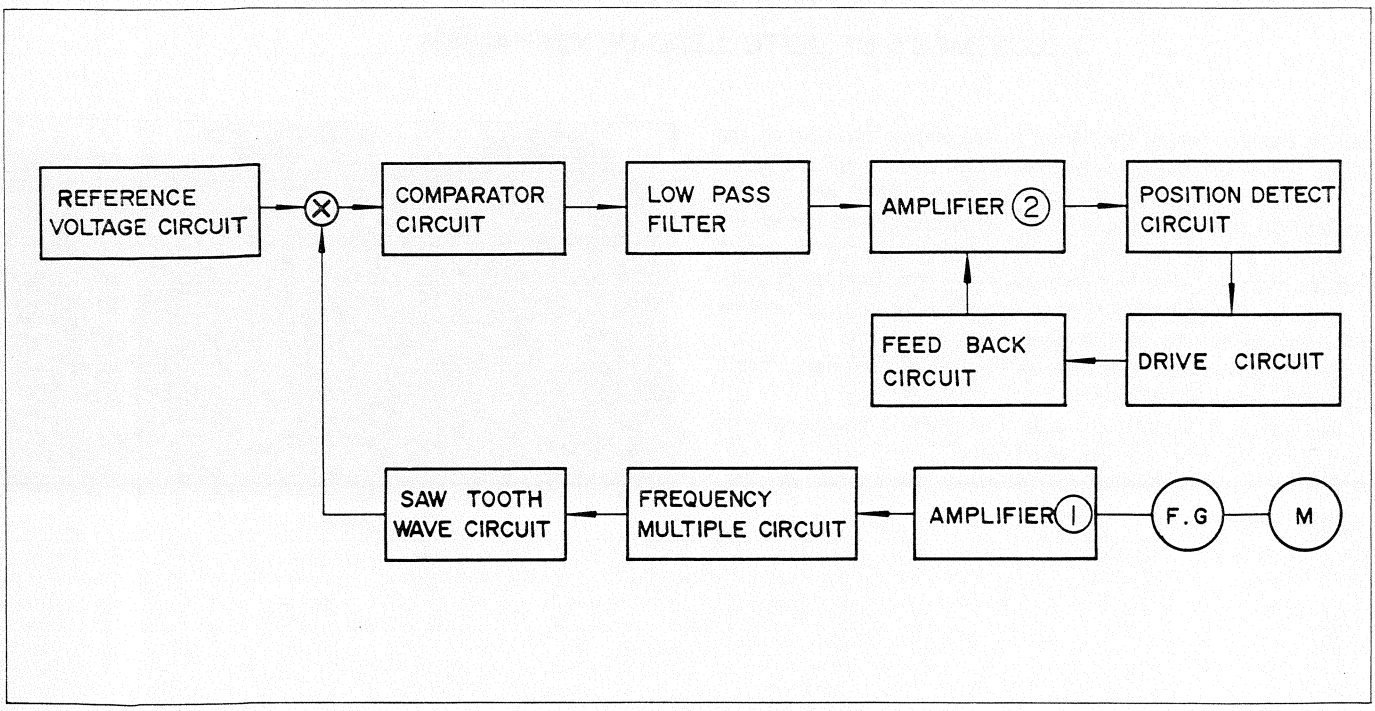


Figure 11 BLOCK DIAGRAM

* Refer to Figures 11, 12 and 13.

1) FREQUENCY GENERATOR
The frequency generator consists of 72-pole magnet, 36-tooth multi-gap head and coil and it creates sine waves of 20 Hz and 27 Hz respectively when an LP disk and EP disk are played.

2) AMPLIFIER CIRCUIT ①
The amplifier circuit is of 2-stage differential type and it amplifies the output of frequency generator to produce square wave of 50% duty cycle.
Semi-variable resistor VR1 (330 ohm B) is to adjust the square wave so that its duty cycle becomes 50%: this is because that the output of this circuit will be premitted to be multiplied by the frequency multiple circuit.

3) FREQUENCY MULTIPLE CIRCUIT
The frequency multiple circuit is to differentiate conversion output and non-conversion output (the two are of square wave) obtained from the said amplifier circuit so as to create pulses each having a swifter rising and a narrow width. Each of the pulses is then applied to the switching transistor in which it will be shaped to a saw tooth wave. Each of the switching transistors can be turned on when given a positive pulse so that the frequency be multiplied (doubled).

4) SAW TOOTH WAVE GENERATOR CIRCUIT
The generator circuit is composed of a C/R circuit which serves as charging unit and a switching transistor which works to discharge the voltage stored in the capacitor in an instant, and it is thus able to obtain saw tooth waves with the height being nearly in proportion to a given frequency.

5) REFERENCE VOLTAGE CIRCUIT
The reference voltage circuit is to produce a reference voltage that determines the rotation number of motor, in which output of the voltage regulated circuit is resistor-divided to be made a constant voltage. Variable resistor is provided to permit the voltage-division ratio be varied, thereby the motor's rotation number being variable.

6) COMPARATOR CIRCUIT
The comparator circuit consists of differential comparator circuit and switching transistor and it is to compare the level of the saw tooth wave 4) and that of reference voltage 5) to each other so that there will be on-off pulses available. off-pulse is obtained when the height of saw tooth wave is lower than the level of reference voltage while on-pulse when the former is higher than the latter: a variation of the frequency (that of the motor's rotation number) is converted into an average variation of the output pulse.

7) LOW-PASS FILTER
The low-pass filter is a 2-stage CR primary low-pass filter that is to have the output pulse of comparator circuit be smoothed.

8) AMPLIFIER CIRCUIT ②
The amplifier circuit is to amplify the output of low-pass filter to apply it to the hall device.

9) POSITION DETECT CIRCUIT
The position detect circuit serves to detect N-pole or S-pole of the rotor magnet by means of hall device so that it can determine the sequence by which 4 drive coils will be given a current one after another. Meanwhile, voltage applied to the hall device is regulated by the control circuit described in the steps 1) to 8) above and output voltage of the hall device is varied according to a variation of the rotation number of motor.

10) DRIVE CIRCUIT
The drive circuit is the one which amplifies the output of hall device to have a current run in the drive coil.

11) FEEDBACK CIRCUIT
The feedback circuit is to carry out a negative feedback operation from the drive circuit to the amplifier circuit ②, thus letting the entire operation of control circuit be more stabilized.

Waveforms of the Circuits (with DC 20 V)
(The points Ⓐ to Ⓗ are identical to those indicated in the annexed "Circuit Diagram" Figure 13.)

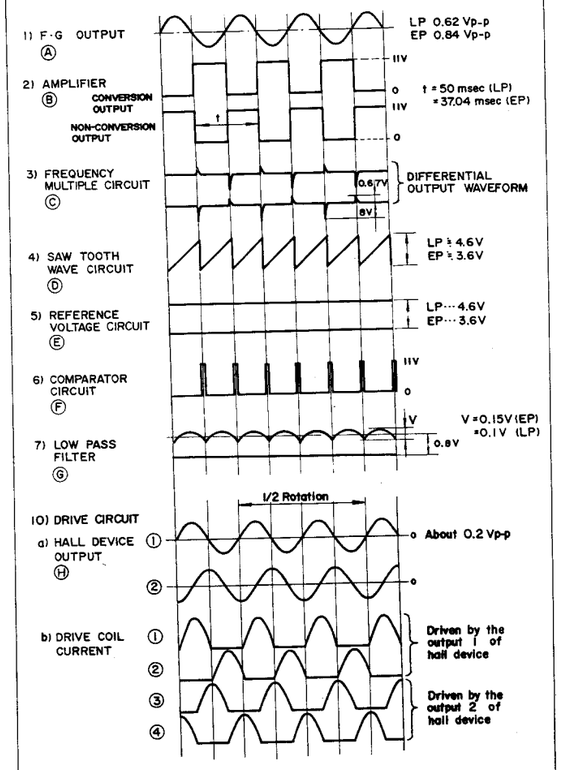


Figure 12 WAVE FORMS OF THE CIRCUIT

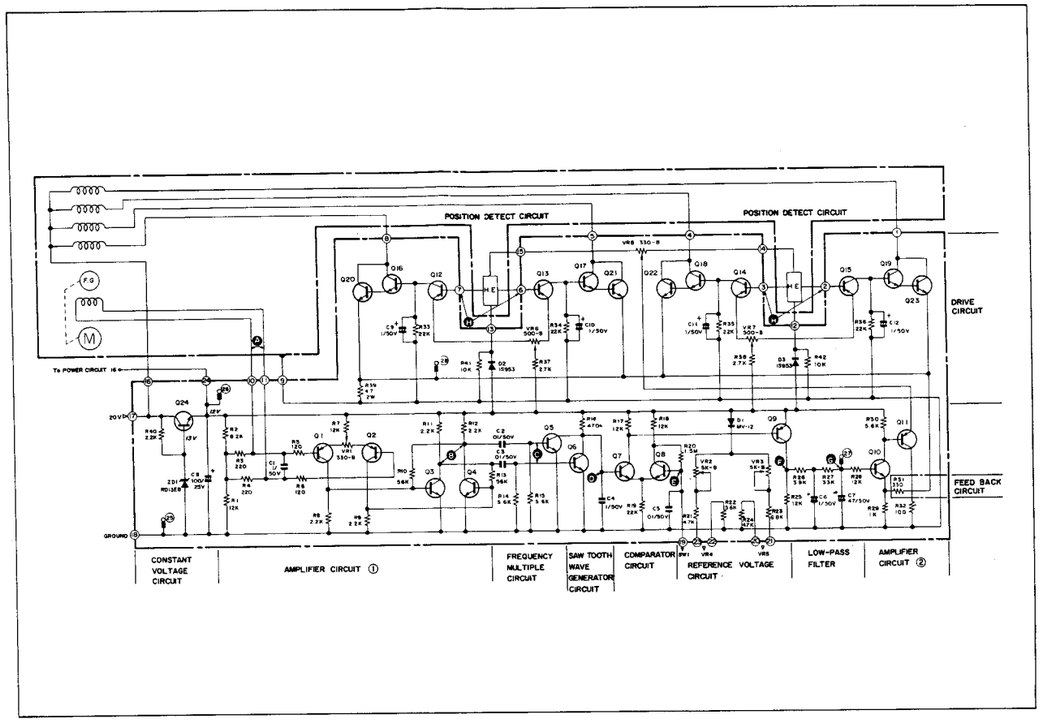


Figure 13

CIRCUIT MOTION WHILE THE ROTATION NUMBER BEING VARIED

Circuit Motion while the Rotation Number Being Varied
In which, $N_1 > N_2 > N_3$

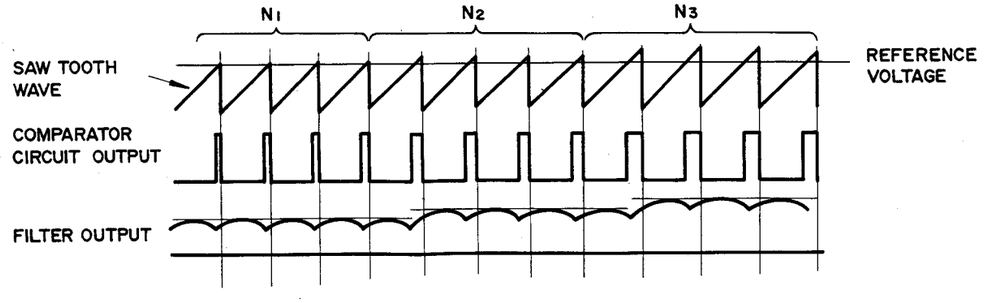


Figure 14

■ ADJUSTMENT OF THE MOTOR'S ROTATION

(Refer to Figures 18 and 19)

The revolutional speed of turntable minutely varies according to the hour during a day, therefore, take the following procedures to obtain an exact speed.

1. Turn the speed fine adjustment knob clockwise or anti-clockwise to adjust so that the stripe pattern of a stroboscope provided at the platter looks like stationary.
   When the stripe pattern is moving in the turning direction of platter, this shows that the rotational speed of turntable is faster than as specified.
   In this case, adjust it by turning the speed fine adjustment knob toward 's'.
   Or, when the stripe pattern is moving against the turning direction of platter this shows that the turntable rotates slower than as specified. In such a case, adjust it by turning the speed fine adjustment knob toward 'f'.
2. Even after the completion of the above adjustment it may be found that the stripe pattern of the stroboscope somewhat moves. This is, however, resulted from the fluctuation in frequency of the supplied power, which does not mean abnormal rotation of the turntable at all. Therefore, no further adjustment is required.
3. When the servo-control P.W. board or other electrical parts are replaced for repairing, adjust the turntable speed in the following manner.
   1) Set the speed fine adjustment knobs (VR4, VR5) to the central position.
   2) Adjust the semi-variable resistors (VR2, VR3) so that the stripe pattern of a stroboscope provided at the platter looks like stationary.
      VR2 . . . . . For 33-1/3 r.p.m. Adjust
      VR3 . . . . . For 45 r.p.m. Adjust

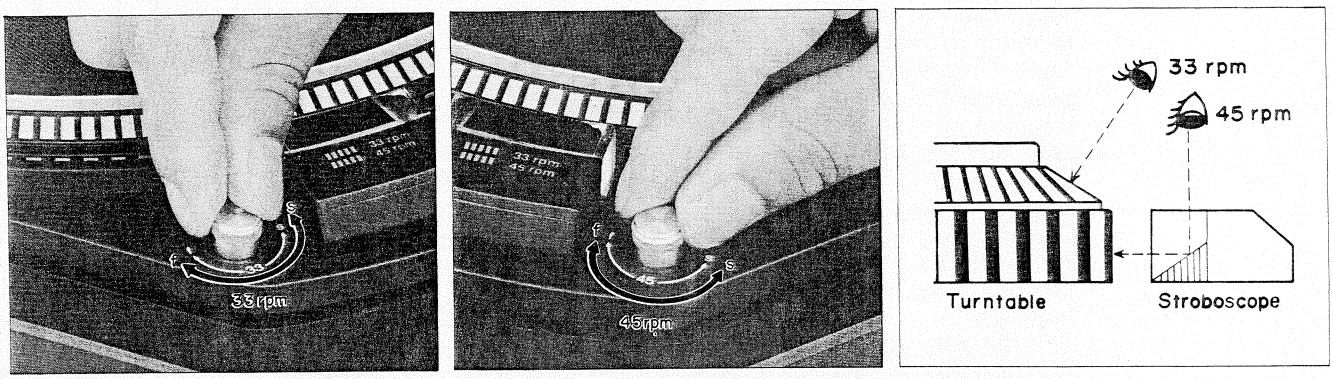


Figure 18

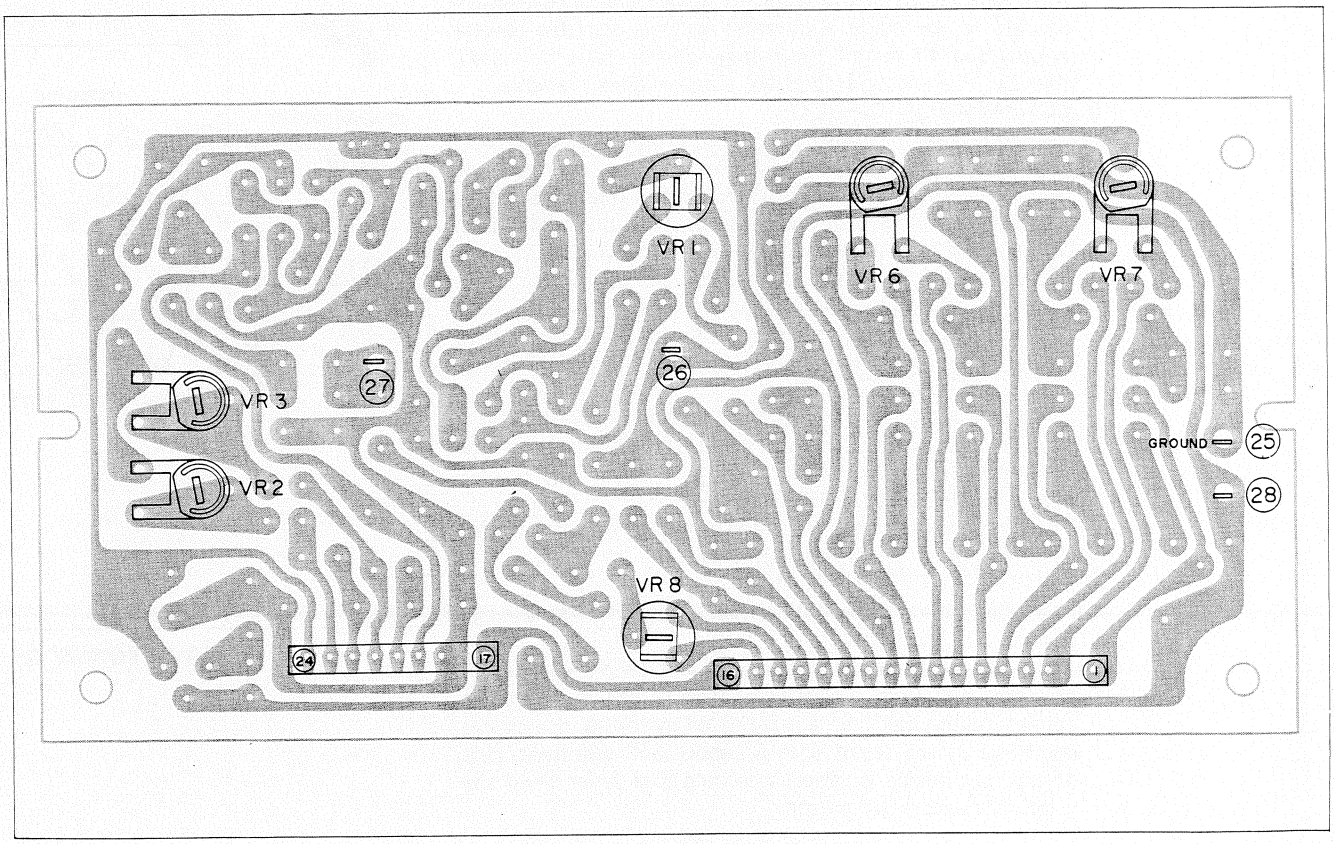


Figure 19 ALIGNMENT POINT

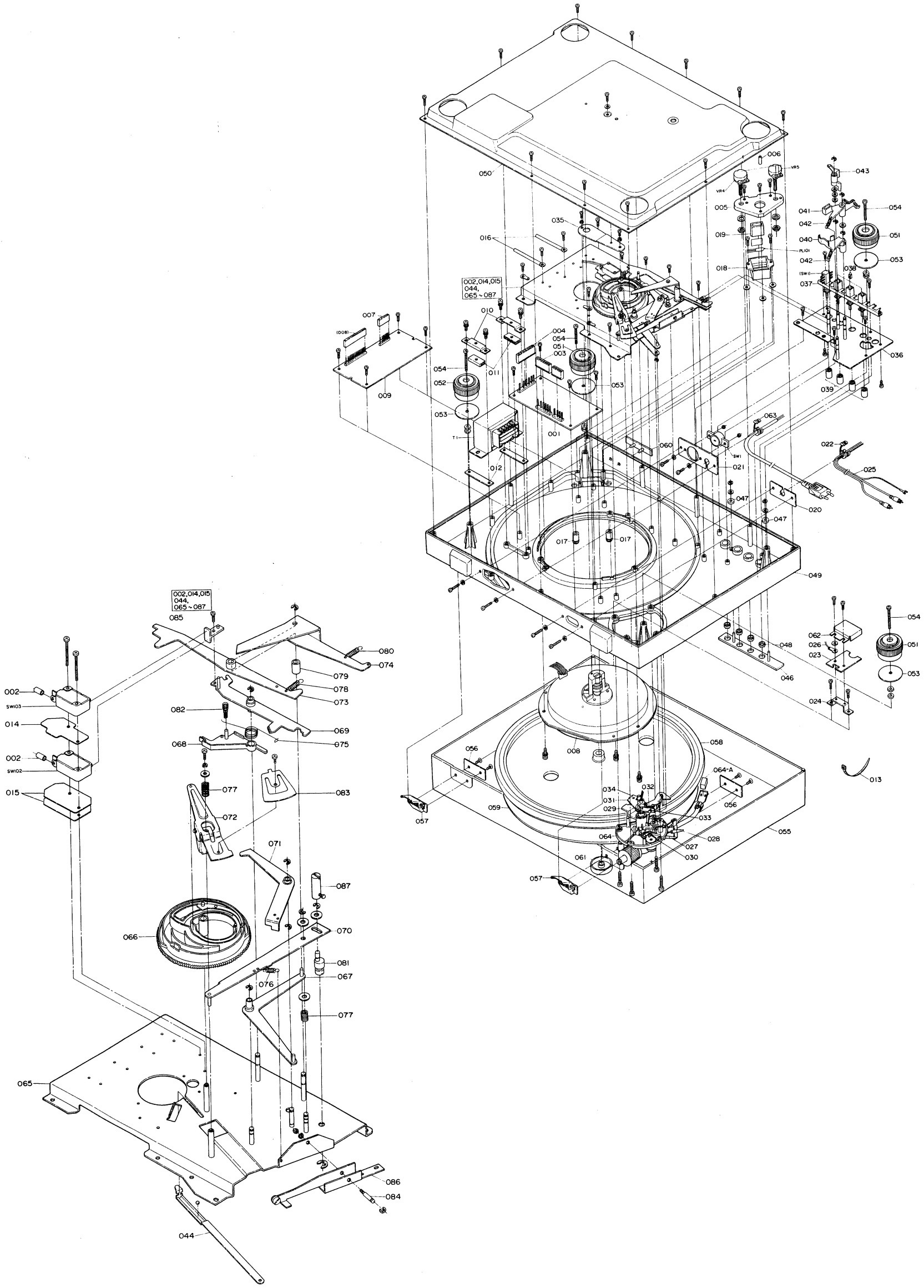
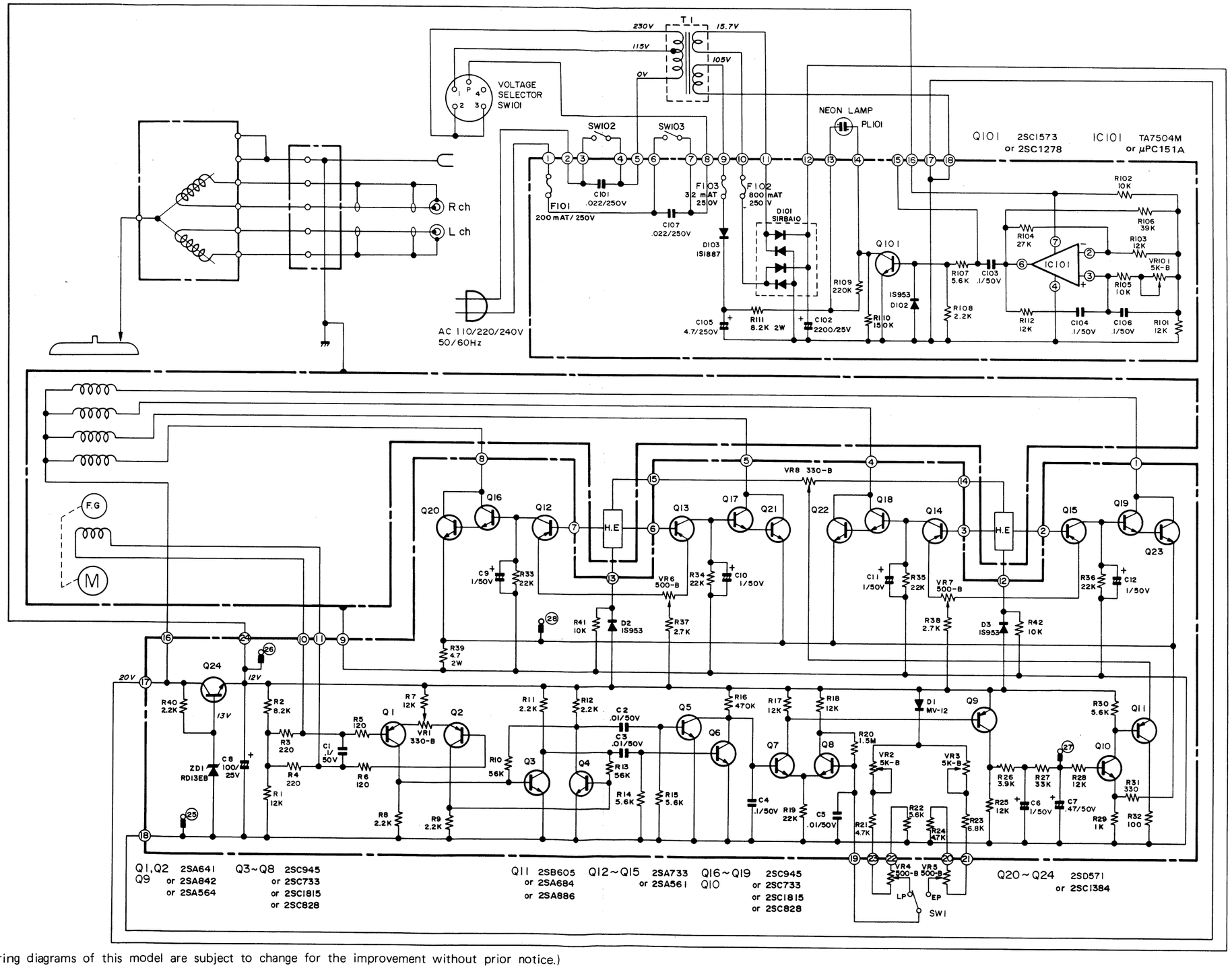


Figure 20 EXPLODED VIEW



(Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.)

Figure 21 SCHEMATIC DIAGRAM

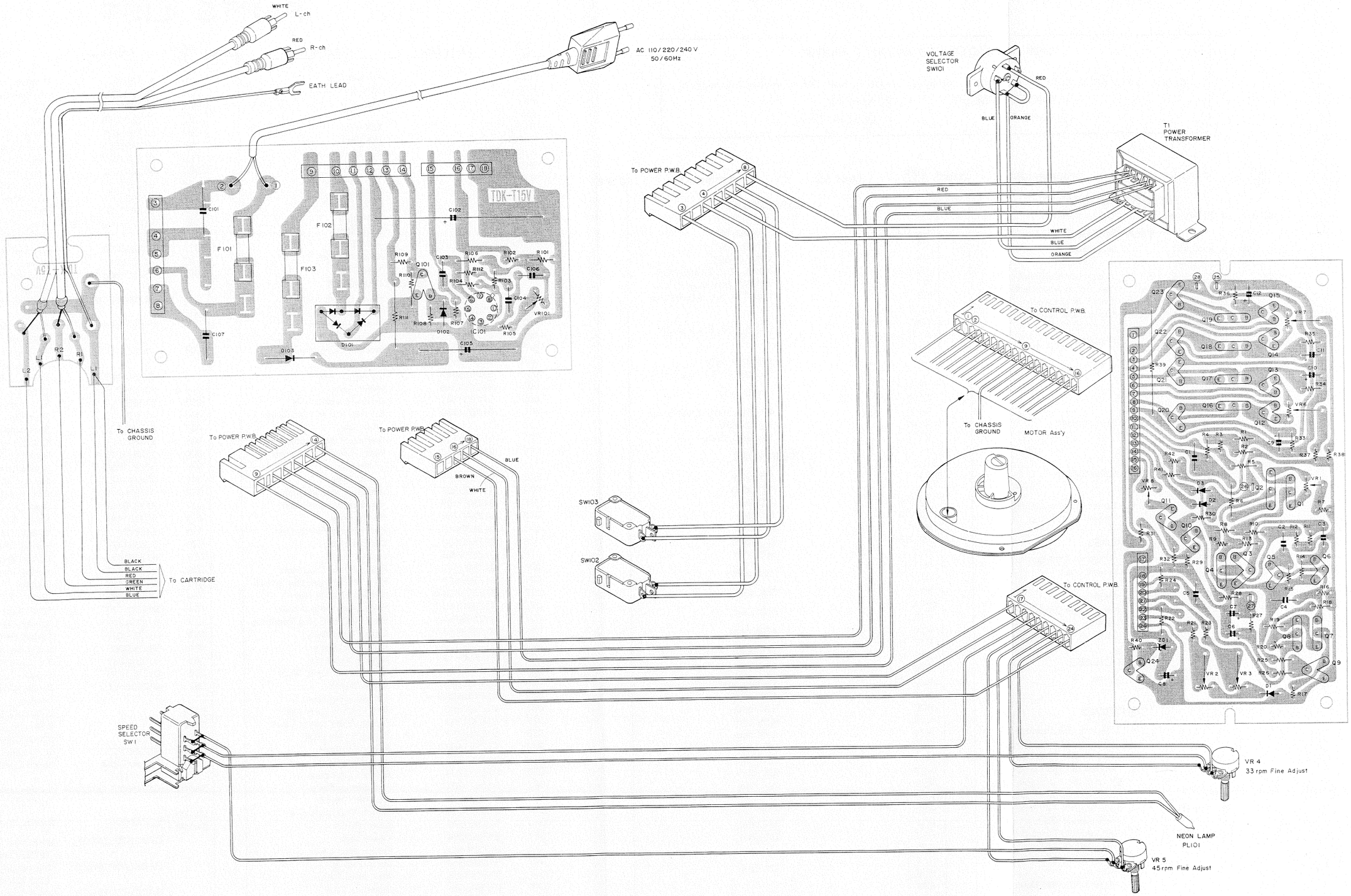


Figure 22 WIRING SIDE OF P.W. BOARD

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE
		INTEGRATED CIRCUIT	
IC101	91ZTA7504M	DC Amplifier	
		TRANSISTORS	
Q1, Q2	91Z2SA641	Amplifier (1)	
Q3, Q4	91Z2SC945	Amplifier (1)	
Q5	91Z2SC945	Frequency Multiple Circuit	
Q6	91Z2SC945	Saw Tooth Wave Generator	
Q7, Q8	91Z2SC945	Comparator Circuit	
Q9	91Z2SA641	Comparator Circuit	
Q10	91Z2SC945	Amplifier (2)	
Q11	91Z2SB605	Amplifier (2)	
Q12, Q13, Q14, Q15	91Z2SA733	Drive Circuit	
Q16, Q17, Q18, Q19	91Z2SC945	Drive Circuit	
Q20, Q21, Q22, Q23	91Z2SD571	Drive Circuit	
Q24	91Z2SD571	Constant Voltage Circuit	
Q101	91Z2SC1573	Driver, Neon Lamp	
		DIODES	
D1	91ZMV-12	Reference Voltage Circuit	
D2, D3	91Z1S953	Drive Circuit	
D101	91ZSIRBA10	Rectifier	
D102	91Z1S953	Neon Lamp Drive Circuit	
D103	91Z1S1887	Rectifier	
ZD1	91ZRD13E(B)	Constant Voltage Circuit	
		TRANSFORMER	
T1	91Z875155	Power	
		CONTROLS	
VR1		330 ohm, (B), Frequency Multiple Circuit Adjust	
VR2		5K ohm (B), Turntable Speed Adjust (33-1/3 r.p.m.)	
VR3		5K ohm (B), Turntable Speed Adjust (45 r.p.m.)	
VR4	91Z702986	500 ohm (B), Turntable Speed Fine Adjust (33-1/3 r.p.m.)	
VR5	91Z702986	500 ohm (B), Turntable Speed Fine Adjust (45 r.p.m.)	
VR6, VR7		500 ohm (B), 4 Coil Current Adjust	
VR8		330 ohm (B), Hall Device Adjust	
VR101		5K ohm (B), DC Amp. Circuit	

REF. NO.	PART NO.	DESCRIPTION	CODE
		CAPACITORS	
C1		.1MFD, 50V	
C2, C3		.01MFD, 50V	
C4		.1MFD, 50V	
C5		.01MFD, 50V	
C6		1MFD, 50V, Electrolytic	
C7		.47MFD, 50V, Electrolytic	
C8		100MFD, 25V, Electrolytic	
C9, C10, C11, C12		1MFD, 50V, Electrolytic	
C101		.022MFD, 250V	
C102		2200MFD, 25V, Electrolytic	
C103, C104		.1MFD, 50V	
C105		4.7MFD, 250V, Electrolytic	
C106		.1MFD, 50V	
C107		.022MFD, 250V	
		RESISTORS	
R1		12K ohm	
R2		8.2K ohm	
R3, R4		220 ohm	
R5, R6		120 ohm	
R7		12K ohm	
R8, R9		2.2K ohm	
R10		56K ohm	
R11, R12		2.2K ohm	
R13		56K ohm	
R14, R15		5.6K ohm	
R16		470K ohm	
R17, R18		12K ohm	
R19		22K ohm	
R20		1.5 Meg ohm	
R21		4.7K ohm	
R22		5.6K ohm	
R23		6.8K ohm	
R24		4.7K ohm	
R25		12K ohm	
R26		3.9K ohm	
R27		33K ohm	
R28		12K ohm	
R29		1K ohm	
R30		5.6K ohm	
R31		330 ohm	
R32		100 ohm	
R33, R34, R35, R36		22K ohm	
R37, R38		2.7K ohm	
R39		4.7 ohm, 2W	
R40		2.2K ohm	
R41, R42		10K ohm	
R101		12K ohm	
R102		10K ohm	
R103		12K ohm	
R104		27K ohm	
R105		10K ohm	
R106		39K ohm	
R107		5.6K ohm	
R108		2.2K ohm	
R109		220K ohm	
R110		150K ohm	
R111		8.2K ohm, 2W	
R112		12K ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
		MISCELLANEOUS	
001	91Z871189	Power Circuit Ass'y	
002	91Z892484	Tube, Insulator	
003	91Z895758	Connector Ass'y	
004	91Z704151-1	Socket, Power	
005	91Z895591	Bracket, Lamp/Volume	
006	91Z702233-3	Tube, Insulator	
007	91Z895733	Connector, Ass'y	
008	91Z631318	Motor Ass'y	
009	91Z631347	Control Circuit Ass'y	
010	91Z894989	Bracket, Power Transformer Retaining	
011	91Z895734	Bushing, Power Transformer	
012	91Z895735	Plate, Power Transformer Retaining	
013	91Z894408	Holder, Wire	
014	91Z893327	Insulator, Micro Switch	
015	91Z895157	Insulator, Micro Switch	
016	91Z890755	Holder, Wire	
017	91Z892618	Knob, Speed Fine Adjust	
018	91Z895592	Cover, Lamp	
019	91Z895595	Holder, Lamp	
020	91Z893037	Plate, Output Lead Hold	
021	91Z895689	Plate, Voltage Selector Switch	
022	91Z891568-4	Bushing, Output Lead	
023	91Z895155-1	P.W. Board, Output Lead	
024	91Z895154-1	Bracket, P.W. Board Retaining	
025	91Z893699-1	Output Lead Ass'y	
026	91Z894509-6	Earth Lead Ass'y	
027	91Z895739	Select Lever Ass'y	
028	91Z895594	Lever, Select Lever Ass'y	
029	91Z895593	Lever, Selector	
030	91Z700508-1	Spring, Select Lever	
031	91Z895866	Arm Control Lever Ass'y	
032	91Z801553	Spring, Arm Control Lever	
033	91Z813681	Spring, Screw Lock	
034	91Z891452-1	Friction Rubber	
035	91Z895585	Plate, Main Gear	
036	91Z871208	Bracket, Operation	
037	91Z871204	Push Switch Ass'y	
038	91Z895708	Tip, Push Switch	
039	91Z895688	Button, Push Switch	
040	91Z895588	Lever, Reject	
041	91Z895589	Lever, Start	
042	91Z891443	Spring, Start Lever	
043	91Z895590	Lever, Repeat	
044	91Z870066	Arm, Auto Return	
046	91Z895586	Operation Plate	
047	91Z892940-1	Rubber	
048	91Z895587	Ring, Operation Plate	

REF. NO.	PART NO.	DESCRIPTION	CODE
049	91Z846367	Cabinet	
050	91Z846368	Bottom Cover	
051	91Z895745	Leg	
052	91Z895745-1	Leg	
053	91Z895691	Plate, Leg	
054	91Z895967	Screw, Leg Retaining	
055	91Z851097-3	Dust Cover	
056	91Z895231	Plate, Hinge	
057	91Z895215	Hinge Ass'y	
058	91Z620026	Turntable	
059	91Z871160	Sheet, Turntable	
060	HBDGD3054AFSA	Badge, OPTONICA (91Z893820)	
061	91Z890876	EP Adaptor	
062	91Z895218	Shield, Output P.W. Board	
063	91Z891568-1	Bushing, Mains Supply Cord (SAA)	
	91Z891568-2	Bushing, Mains Supply Cord (BS)	
	91Z891568-3	Bushing, Mains Supply Cord (KEMA)	
064	91Z851187	Pick-up Ass'y (Without Cartridge)	
	91Z851187-1	Pick-up Ass'y (With Cartridge)	
064-A	91Z895740	Cartridge Ass'y	
065	91Z851227	Sub-chassis Ass'y	
066	91Z870317	Main Gear Ass'y	
067	91Z891431	Switching Lever Ass'y	
068	91Z891951	Clutch Lever Ass'y	
069	91Z891016-1	Switching Lever Ass'y	
070	91Z891435	Select Arm Ass'y	
071	91Z891437	Select Guide Lever Ass'y	
072	91Z870172	Rotation Plate Ass'y	
073	91Z870157	Start Lever Ass'y	
074	91Z891444	Lever, Repeat	
075	91Z891474	Spring, Clutch Lever	
076	91Z891438	Spring, Select Arm	
077	91Z891475	Spring, Safety	
078	91Z891443	Spring, Start Lever	
079	91Z891445	Bushing	
080	91Z893566	Spring, Repeat Lever	
081	91Z895720	Shaft, Eccentric	
082	91Z891947	Spring, Clutch Lever	
083	91Z891022	Spring, Rotation Plate	
084	91Z890095	Shaft, See-saw Lever	
085	91Z894937	Tip, Switching Lever	
086	91Z891785	See-saw Lever Ass'y	
087	91Z895721	Screw, Auto Read-in Mechanism Adjust	
F101		200mAT/250V	
F102		800mAT/250V	
F103		32mAT/250V	
PL101	91Z895757	Neon Lamp	
SW1	Not available Part of 037	Speed Selector Switch	
SW101	OSOCE0551AGZZ	Switch, Voltage Selector (91Z871207)	
SW102, SW103	91Z893538	Switch, Power	
	QACCB0052AF09	Mains Supply Cord (BS) (91Z895961)	
	QACCL0001AGZZ	Mains Supply Cord (SAA) (91Z895940)	
	QACCV0001AGZZ	Mains Supply Cord (KEMA) (91Z892280)	
	QACCZ0002TA0F	Mains Supply Cord (A-CLUB)	

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